YATES CUTOFF

PURPOSE

Specify which factor estimates are printed by the YATES ANALYSIS command.

DESCRIPTION

The YATES ANALYSIS command estimates the factor effects in 2-level full factorial and fractional factorial designs. It yields factor estimates for all of the coefficients (main effects and all relevant interactions). The primary output from the Yates analysis is a list which consists of 5 columns:

1. A factor identifier (all from Yates order):

   1 = factor 1
   2 = factor 2
   3 = factor 3
   12 = factor 1 x factor 2 interaction
   13 = factor 1 x factor 3 interaction
   23 = factor 2 x factor 3 interaction
   123 = factor 1 x factor 2 x factor 3 interaction
   etc.

2. Least squares estimated factor effects ordered from largest in magnitude (most significant) to smallest in magnitude (least significant).

3. A t value (= e / sd(e)) where

   e is the estimated factor effect;
   sd(e) is the estimated standard deviation of e.

   Adjacent to this t value is an indication (* or **) as to whether the estimated effects are statistically significant at the 5% level (*) or 1% (**) level.

4. The residual standard deviation that results from the model:

   response = constant + 1/2 (that single factor only)

   This information is of interest but not that important.

5. The (cumulative) residual standard deviation that results from the model:

   response = constant + 1/2 (all factors down to and including the factor of interest).

   This column will consist of a monotonically decreasing set of residual standard deviations (indicating a better and better fit as the number of terms included in the model increases). The cumulative residual standard deviation at the top of the column is for the simplest model:

   response = constant + no factors

   The cumulative residual standard deviation (identically 0) at the bottom of the column is for the most complicated model:

   response = constant + 1/2 (all factors and interactions)

The YATES CUTOFF command is used to control which factor estimates are printed. The criterion can be given in terms of the t-values (column 3 as described above), of the residual standard deviation (column 4 as described above), or in terms of the absolute value of the coefficient (column 2 as described above).

SYNTAX 1

YATES COEF CUTOFF <value>
where <value> is a number or parameter that specifies the cutoff value for the estimated factor coefficient.

Only factor estimates that have a coefficient with an absolute value less than or equal to <value> are printed.

SYNTAX 2

YATES T CUTOFF <value>
where <value> is a number or parameter that specifies the cutoff value for the estimated factor t-value.

Only factor estimates that have a t-value with an absolute value greater than or equal to <value> are printed.

SYNTAX 3

YATES RESSD CUTOFF <value>

where <value> is a number or parameter that specifies the cutoff value for the estimated factor residual standard deviation.

Only factor estimates that have a residual standard deviation less than or equal to <value> are printed.

EXAMPLES

YATES COEF CUTOFF 10
YATES T CUTOFF 1.0
YATES RESSD CUTOFF 0.5

NOTE

All 3 criteria (COEF/T/RESSD) can be specified for the same Yates analysis. These criteria are tested independently of each other.

DEFAULT

All factor estimates are printed.

SYNONYMS

None

RELATED COMMANDS

YATES ANALYSIS	=	Carries out a Yates analysis.
YATES OUTPUT	=	Specify which sections of the Yates analysis to print.

APPLICATIONS

Design of Experiments

IMPLEMENTATION DATE

89/12

PROGRAM

```
. THIS IS AN EXAMPLE OF A YATES ANALYSIS
. OF A 2**3 FULL FACTORIAL DESIGN.
SKIP 25
READ BOXSPRIN.DAT Y X1 X2 X3
SKIP 0
YATES Y
YATES COEF CUTOFF 5
YATES Y
YATES COEF CUTOFF INFINITY
YATES T CUTOFF 1.0
YATES Y
YATES T CUTOFF INFINITY
YATES RESSD CUTOFF 0.5
YATES Y
```

The following output is

```
***************
**  YATES Y  **
***************


            ****************************
            **      2**K DEX FIT       **
            ****************************

 (NOTE--DATA MUST BE IN STANDARD ORDER)
 NUMBER OF OBSERVATIONS           =        8
 NUMBER OF FACTORS                =        3
 NO REPLICATION CASE

 PSEUDO-REPLICATION STAND. DEV.   =    0.70710676908E+00
 PSEUDO-DEGREES OF FREEDOM        =        1
 (THE PSEUDO-REP. STAND. DEV. ASSUMES ALL
 3, 4, 5, ...-TERM INTERACTIONS ARE NOT REAL,
 BUT MANIFESTATIONS OF RANDOM ERROR)

 STANDARD DEVIATION OF A COEF.    =    0.50000000000E+00
 (BASED ON PSEUDO-REP. ST. DEV.)

 GRAND MEAN                       =    0.71250000000E+02
 GRAND STANDARD DEVIATION         =    0.13719120979E+02

 99% CONFIDENCE LIMITS (+-)       =    0.31828401566E+02
 95% CONFIDENCE LIMITS (+-)       =    0.63531084061E+01
 99.5% POINT OF T DISTRIBUTION    =    0.63656803131E+02
 97.5% POINT OF T DISTRIBUTION    =    0.12706216812E+02

                IDENTIFIER    EFFECT        T VALUE      RESSD       RESSD
                                                       MEAN+TERM  MEAN+TERMS
-------------------------------------------------------------------------------
                     MEAN      71.25000                  13.71912   13.71912
                        1      23.00000         46.0*     6.57647    6.57647
                       13      10.00000         20.0*    13.64734    3.44964
                        2      -5.00000        -10.0     14.53444    1.54110
                        3       1.50000          3.0     14.79302    1.29099
                       12       1.50000          3.0     14.79302    0.50000
                      123       0.50000          1.0     14.81553    0.00000
                       23       0.00000          0.0     14.81834    0.00000

NOTE--TAG, COEF, TCOEF, RESSD, & CUMULATIVE RESSD
      WRITTEN TO FILES DPST1F.DAT AND DPST2F.DAT
```

```
***************
**  YATES Y  **
***************


            ****************************
            **      2**K DEX FIT       **
            ****************************

 (NOTE--DATA MUST BE IN STANDARD ORDER)
 NUMBER OF OBSERVATIONS           =        8
 NUMBER OF FACTORS                =        3
 NO REPLICATION CASE

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 97.5% POINT OF T DISTRIBUTION    =    0.12706216812E+02

                IDENTIFIER    EFFECT        T VALUE      RESSD      RESSD
                                                       MEAN+TERM  MEAN+TERMS
-------------------------------------------------------------------------
                     MEAN      71.25000                  13.71912   13.71912
                        1      23.00000         46.0*     6.57647    6.57647
                       13      10.00000         20.0*    13.64734    3.44964

NOTE--TAG, COEF, TCOEF, RESSD, & CUMULATIVE RESSD
      WRITTEN TO FILES DPST1F.DAT AND DPST2F.DAT
```

```
***************
**  YATES Y  **
***************


           ****************************
           **      2**K DEX FIT       **
           ****************************

(NOTE--DATA MUST BE IN STANDARD ORDER)
NUMBER OF OBSERVATIONS           =        8
NUMBER OF FACTORS                =        3
NO REPLICATION CASE

PSEUDO-REPLICATION STAND. DEV.   =    0.70710676908E+00
PSEUDO-DEGREES OF FREEDOM        =        1
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```

IDENTIFIER	EFFECT	T VALUE	RESSD MEAN+TERM	RESSD MEAN+TERMS
MEAN	71.25000		13.71912	13.71912
1	23.00000	46.0*	6.57647	6.57647
13	10.00000	20.0*	13.64734	3.44964
2	-5.00000	-10.0	14.53444	1.54110
3	1.50000	3.0	14.79302	1.29099
12	1.50000	3.0	14.79302	0.50000

```
               ***************
               **  YATES Y  **
               ***************


                         ****************************
                         **      2**K DEX FIT      **
                         ****************************

               (NOTE--DATA MUST BE IN STANDARD ORDER)
               NUMBER OF OBSERVATIONS           =        8
               NUMBER OF FACTORS                =        3
               NO REPLICATION CASE

               PSEUDO-REPLICATION STAND. DEV.   =    0.70710676908E+00
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IDENTIFIER	EFFECT	T VALUE	RESSD MEAN+TERM	RESSD MEAN+TERMS
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3	1.50000	3.0	14.79302	1.29099

```
NOTE--TAG, COEF, TCOEF, RESSD, & CUMULATIVE RESSD
      WRITTEN TO FILES DPST1F.DAT AND DPST2F.DAT
```